

PATENT APPLICATION
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[1064 001 301 0202]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE
BOARD OF PATENT APPEALS AND INTERFERENCES

Arthur Papier and Nancy Weyl - Appellants

Inventor:	Arthur Papier et al.	Conf. No.:	4087
Application No.:	09/919,275	Group Art Unit:	3621
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Title:	SYSTEM AND METHOD TO AID DIAGNOSES USING CROSS-REFERENCED KNOWLEDGE AND IMAGE DATABASES		

APPELLANTS' BRIEF ON APPEAL

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1. REAL PARTY IN INTEREST

Logical Images, Inc. by assignment from Inventors/Appellants, Arthur Papier and Nancy Weyl, recorded October 12, 2001 at Reel /Frame 012258 / 0277.

2. RELATED APPEALS AND INTERFERENCES

NONE.

3. STATUS OF CLAIMS:

Claims 1 - 24 and 28 remain rejected in the application. Claims 25 – 27 and 29 - 30 have been withdrawn from consideration pursuant to a restriction set forth in the Office Action of October 14, 2004. The rejections of claims 1 - 24 and 28 are appealed herein.

4. STATUS OF AMENDMENTS:

No amendment after Final Rejection was submitted. The claims stand as last amended by right on March 28, 2005, prior to the final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER:

As set forth in the specification and claims, the present invention is directed to “a system and method for automatically controlling the selection and display of visual information to assist a user in testing and/or arriving at diagnostic hypotheses.” (Specification p. 1, lines 26-28) Appellants further set forth advantages and aspects of the claimed invention in the Specification (Background and Summary), where it is stated that,

“...The VisualDx system is intended for use in patient treatment or care settings to assist users in identifying possible diagnoses based upon a set or constellation of patient findings.

...

The present invention is intended to be an improvement to paper-based atlases that doctors consult when investigating possible diagnoses. ... The system is believed to be distinguishable from other

medical diagnostic system that simply seek a set of symptoms and input the symptoms to an artificial-intelligence engine to create a ranked (by probability) list of diagnoses. To the contrary, the present invention uses categories or constellations of patient findings, or sample characteristics, to provide a combination of textual and graphic/image information to the user, so that the user may test or review a plurality of possible diagnoses without being "lead" to one diagnosis over another. In other words, the present system provides a source of knowledge (medical or other), in multiple forms, that allow users to test diagnostic hypotheses against an image database using patient findings or sample characteristics.

In the visually centered medical specialties (e.g., dermatology, radiology, ophthalmology, pathology) physicians hone their ability to classify, correctly identify, and relate the visual features of disease to a knowledge base of diagnostic features, criteria etc. Accordingly, an objective of the instant invention is a software-based schema or strategy to assist less experienced medical users in the interpretation of visual clues (presentations and/or findings) as they relate to diagnostic hypotheses. Both graphical representations, drawings and refined picture icons (PICONS) are used to augment the medical keywords in the software database.

One purpose of the present invention is to provide near instantaneous access to diagnostically relevant images at the place where they may be used – for example when interviewing a patient. The present system relies upon a combinatorial, non-expert system approach to diagnosis or identification along with access to related images. ...

The present invention, to a significant degree, builds upon an innate human ability to match patterns. ... Moreover, all visual identification problems benefit from user experience and knowledge. When prior visual knowledge is limited, picture or image "centered" reference materials can assist the inexperienced. Paper based, pictorial references have a linear structure and do not allow for user-defined groupings and matching of pictures. Software based image systems

offer the possibility of combinatorial searching as well as user-defined comparison of possibilities.

The visual diagnostic embodiment of the present invention, VisualDx, assembles textual and visual knowledge, thereby creating the ability to "presort" and display images so that a user can more effectively engage in pattern matching. These unique functional, organizational and graphical display capabilities are useful within any professional area where an individual has to make a visual "diagnosis" or identification, or recognize a visual feature."

(Specification pp. 2 – 3 excerpts; emphasis added)

Appellants further urge the distinctiveness and advantages of the present invention, including the advantages, as noted above, of a practitioner being able to review a plurality of images associated with possible diagnoses, whereby the user has access to images related to various diagnoses and can review them in a side-by-side manner for purposes of comparison as described, for example at page 24, line 21 through page 25, line 3, which states in part:

"...an image stack button 348, allowing the user to view a plurality of images 356 in the image stack in scrollable window region 358 as shown in Figure 9. As Figure 9 illustrates, the images related to a particular diagnoses are displayed in a scrollable "contact sheet" where particular images may also be selected (clicking on the reduced size image) to display an enlarged, full-screen view as shown in Figure 15."

The display of a plurality of images, in the various display options described on pages 29 through 30, each provide the user with visual access to several images at a time, and thereby increase the effectiveness of system to the user. As described, for example, at page 33, lines 1 – 5,

"In one embodiment, the images associated with a particular diagnosis are related as a "stack." The images in a stack may be sorted based on closeness of view, body location and lesion type. The user may be able to select which sort method is used, although a default may be used for actively displayed image stacks, where the default may or may not be related to a lesion type or other defined finding."

Appellants respectfully urge that the various features set forth above, as claimed and supported by the disclosure of the present application, provide significant advantages to users of such systems – particularly as aids to diagnoses where practitioners are able to closely review and match what is display by the system with that which the practitioner is observing on the patient. Appellants further submit the following information in support of the claimed features of the present application.

Independent Claim 1: Claim 1 is directed to a system to aid in a visual diagnostic process as depicted, for example, in Figs. 1 – 4, and as described, for example, at pages 10 – 20 of the Specification. The image database is depicted as part of the database schema set forth in Figs. 3 and 4, and is described at p. 12, line 28 - p. 13, line 8; p. 18, line 28 – p. 19, line 10. Appellants further note that as set forth beginning at p. 18,

“the various images used and displayed by the system are maintained in accordance with an ID field in the Image table 210. The images are preferably stored in a designated location indicated by one or more fields within table 210. The images (not shown in Figures 3 or 4) are preferably stored as JPEG files, however any well-known or equivalent image file or image compression format may be used (e.g., TIFF, CPC, PDF, BMP, etc.). In addition, each image preferably has a reduced-size or thumbnail representation (PICON) thereof that may be incorporated with a user-interface display depicting a plurality of such images.”

(Specification p. 18)

The knowledge database (or knowledgebase) is described beginning at page 14, line 11, and the cross-referenced relationship to the image database is described, for example, at page 18, line 31 – page 19, line 1. Similarly, the user interface or display is depicted in Fig. 1 (70, display 72), and is further described, for example, at page 10, line 14 – page 12, line 19. In the description, the user-interface is driven by software operating on the computers, which depicts various objects and selectable display units for selection by the user in order to characterize the patient, sample or other object of the diagnosis. As expressly set forth at page 13, lines 10-13, “the VisualDx software is started and the user, working for example on a remote computer 70 as depicted in Figure 1, may input one or more characteristics that are observable

about the patient or sample (e.g., type of skin lesion, shape of pill) at step 110.” (see also p. 38, lines 11-21).

The operation of the system 50 is generally set forth in relation to Fig. 2, and the system that includes the diagnostic engine “related diagnoses contained within the database, where the selections include at least one of the identified characteristics. Output to the user, for review, is accomplished at step 114, and preferably includes pictorial representation of the diagnoses subset identified via the database.” (p. 13, lines 15-19). In relation to a general discussion of the system of Fig. 1, Appellants urged that “[b]ased upon the constellation of findings or characteristics indicated by the user, both as input by the user or directly provided by the characterization peripheral, a subset of possible diagnoses or identifications is selected from the database for presentation and further consideration by the user – where the presentation preferably includes at least one reduced-size or thumbnail image depicting an example of the diagnosis (e.g., skin lesion picture, pill picture).” (p. 11, lines 11-17). As further described beginning at page 14, “a user may select visual and textual characteristics or findings without prior knowledge of the specialized vocabulary associated with those findings, and the selections, via knowledge base 200, will be translated into queries and output containing findings, diagnoses, images, and their relationships to each other. (p. 14, lines 17-21). And, as further set forth at page 38, lines 19-35, “a diagnostic engine similar to that employed for the VisualDx system, would then identify, from a plurality of possible street drugs, a subset of street or other dangerous drugs that are consistent with the characteristics. Using the subset of street drugs, an information space of the image database could then be sorted for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of images for user review in the identification of the street drug.” The reorganization of the information space is further described at page 38, lines 22-25 and page 41, lines 24-27.

Dependent Claim 2: Support for dependent claim 2 is found, for example, at page 28, beginning at line 21. There, in a description relating initially to Fig. 14, and later to Figs. 8 and 12, the operation of the VisualDx diagnostic engine is described relative to the user-interface. Moreover, as set forth at page 29, lines 5-8, “[u]ser input of each search term or patient finding, as depicted in the user-interface screen, preferably results in immediate re-listing and redisplay of the diagnostic list in window 294 and their related images in window 334.”

Independent Claim 3: Independent claim 3 is directed to a method for aiding a visual diagnostic process, and the various elements of the claim are specifically depicted in Fig. 2. "More specifically, starting with step 100, the images to be used in the system are captured or identified from existing digital images, either obtained directly using digital photography or via the digitization of existing photographs using well-known scanning technologies." (p. 12, lines 21-24). As further described at pages 12-13, the database 58 includes characteristics of the item (e.g., disease, pill, etc.) that is the subject of the image as described in more detail with respect to the database of Figs. 3 and 4. Database 58 is a relational database that supports structured query language (SQL) queries using open database connectivity (ODBC). Step 102 represents entry of characteristic information related to the image, where the image and characteristic information is embodied in a plurality of relational tables within the database that is created at step 104. Once created, the database is available for distribution or transfer to a user's computer as indicated by step 106.

The remaining three elements of claim 3 are disclosed, for example, beginning at page 13, line 10, where the VisualDx software is started and the user inputs one or more characteristics that are observable about the patient or sample (e.g., type of skin lesion, shape of pill) at step 110. Based upon or in response to the characteristic(s) input by a user, the system then automatically analyzes the user input, at step 112, and "automatically selects one or more related diagnoses contained within the database, where the selections include at least one of the identified characteristics." (p. 13, lines 15-17) Output is accomplished at step 114, and includes pictorial representation of the diagnoses subset identified via the database.

Subsequently, the user, as indicated by steps 116 and 118, may select one or more of the diagnoses in the subset for review, including review of one or more images associated with a particular diagnosis, and review of textual information pertaining to the diagnosis. Examples of the user-interface are found in Figs. 8, 10, 12 and 14. Moreover, as indicated by step 118, the user interface described in detail below permits the user to compare and contrast alternative diagnoses within a subset so as to improve the likelihood of an accurate diagnosis by the user. Lastly the user may complete the diagnostic or identification process by making a decision as reflected in step 120.

Dependent Claim 4: As set forth above relative to Fig. 14, user input of each search term or patient finding results in immediate re-listing and redisplay of the diagnostic list in window 294 and their related images in window 334. (p. 29, lines 5-8).

Independent Claim 5: Claim 5 is a system to reduce diagnostic uncertainty and employs cross-referenced knowledge and image databases as depicted, for example, in Figs. 1 - 4. The image database is depicted as part of the database schema set forth in Figs. 3 and 4, and is described, for example, at page 12, line 28 - page 13, line 8; page 18, line 28 through page 19, line 10.

The user interface or display is depicted in Fig. 1 (70, display 72), and is further described, for example, at page 10, line 14 through page 12, line 19. In the description, the user-interface is driven by software operating on the computers, which depicts various objects and selectable display units for selection by the user in order to characterize the patient, sample or other object of the diagnosis. As set forth at page 13, lines 10-13, with the VisualDx software the user inputs one or more characteristics that are observable about the patient or sample at step 110. (see also p. 38, lines 11-21).

Operation of system 50 is generally described in relation to Fig. 2, and the system that includes the diagnostic engine "automatically selects one or more related diagnoses contained within the database, where the selections include at least one of the identified characteristics. Output to the user is accomplished at step 114, and includes pictorial representations of the diagnoses subset identified via the database." (p. 13, lines 15-19). In relation to a general discussion of the system of Fig. 1, Appellants urged that "[b]ased upon the constellation of findings or characteristics indicated by the user, both as input by the user or directly provided by the characterization peripheral, a subset of possible diagnoses or identifications is selected from the database for presentation and further consideration by the user - where the presentation preferably includes at least one reduced-size or thumbnail image depicting an example of the diagnosis (e.g., skin lesion picture, pill picture)." (p. 11, lines 11-17). As further described beginning at page 14, "a user may select visual and textual characteristics or findings without prior knowledge of the specialized vocabulary associated with those findings, and the selections, via knowledge base 200, will be translated into queries and output containing findings, diagnoses, images, and their relationships to each other. (p. 14, lines 17-20). And,

as further set forth at page 38, lines 19-35, “a diagnostic engine similar to that employed for the VisualDx system would then identify ... a subset of street or other dangerous drugs that are consistent with the characteristics.” The reorganization of the information space is further described at page 38, lines 22-25 and page 41, lines 24-27..

Dependent Claim 6: The image stack of Figs. 8 and 9 provides support for the recited element of Fig. 6, which is further described in detail beginning at page 24, line 25, and page 29 lines 13 – 29 (quoted in arguments set forth below).

Dependent Claim 7: Claim 7 sets forth further limitations in relation to the image stack of claim 6. In particular the subset of possible diagnoses or identifications is “selected from the database for presentation and further consideration by the user – where the presentation preferably includes at least one reduced-size or thumbnail image depicting an example of the diagnosis (e.g., skin lesion picture, pill picture).” (p. 11, lines 14-17). The index is initially described relative to Fig. 6, where the user may select from any of the diagnoses presented in scrollable window 294 in order to view the associated images, thereby providing functionality similar to an “index” or a “chapter” in a book, allowing a user to quickly view images related to one or more selected diagnoses. (p. 21, line 30 – p. 22, line 2).

Dependent Claim 8: Support for the display of images in the diagnostic image stack, where such images may be ordered or organized to “depict a natural progression through stages of disease progression” is set forth at page 29, lines 26-28.

Dependent Claim 9: Claim 9 is directed to an image stack where a plurality of images associated with particular diagnoses are displayed. Disclosure of such a feature is described, for example at p. 29, lines 9-28, where it is disclosed that “[e]ach diagnostic ‘stack’ may also allow for a set of controls that permit the user to sort the images in the ‘stacks’ by body location ..., ‘spread’ out the stacked thumbnails so all thumbnails for a particular diagnosis can be viewed in a separate window (e.g., Figure 9), and display the related findings for the diagnosis. Thumbnails will also be easily exploded into full screen images at a mouse click such as depicted on screen 352 in Figure 15.” (p. 29, lines 18-25)

Dependent Claim 10: Claim 10, dependent from claim 5, further describes the system as depicting at least one image including a display of associated

characteristics of diagnoses when a user selects a portion of an image being displayed. A description of this feature is found in the specification at page 24, lines 9-20, where in reference to Figs. 7 and 8, the system is described as updating the user-interface screen of Fig. 8 where the lesion type would be indicated as one characteristic of the patient as a result of the user's selection of location 302 in Fig. 7. Referring to Figure 8, the lesion type selection is reflected in user interface screen 330, where the patient findings window 292 has been updated to show the lesion type and where the possible diagnoses have been reordered to indicate those with a consistent lesion type (raised, non-scaly) in diagnoses window 294.

Dependent Claim 11: As further described relative to Fig. 7, detail button 350 changes the view of the user-interface to that depicted in Fig. 10, where region 298 includes not only a diagnostic image window 338, but also a scrollable text window 354 where a user may view further information and details related to a particular diagnosis. Fig. 11 is, therefore, one example of a display concurrently indicating textual information retrieved from the knowledgebase that is related to at least one of the subset of diagnoses.

Dependent Claim 12: As noted in the Background and Summary section of the Specification, at page 3, lines 17-31, the invention builds upon human ability to perform pattern recognition, where the diagnostic embodiment "presorts" and display images so that a user can more effectively engage in pattern matching relative to a sample or patient. As described at page 13, lines 14-19, "[b]ased upon the characteristic(s) input by a user, the system then automatically analyzes the user input, at step 112, and automatically selects one or more related diagnoses contained within the database, where the selections include at least one of the identified characteristics. Output to the user, for review, is accomplished at step 114, and preferably includes pictorial representation of the diagnoses subset identified via the database."

Dependent Claim 13: The particular application of the system to dermatological manifestations is described in one of the disclosed embodiments of the invention, described as modules, as depicted in Figs. 6 – 15. The Adult Dermatology module embodiment is further described beginning at page 24, line 3.

Dependent Claim 14: The limitation of dependent claim 14 is intended to further refine the nature of the characteristics used to identify diagnoses. In particular, and

distinguishing from the range of images described at various points of the Specification (e.g., microscopic, radiological; p. 3, line 11), the visual findings type is described most efficiently with icons or illustrations (p. 9, lines 16-19). An exemplary use of the visual findings use is described beginning at page 22, line 26 and continuing through the descriptions of Figs. 7, 9 and 12 on pages 24 and 25.

Dependent Claim 15: The mechanical examination means referred to in claim 15 are described, for example, at page 38, lines 12-16, and include at least form, markings, color, shape, weight and size as characteristics.

Dependent Claim 16: In addition to the visual findings of claim 14, the present invention further contemplates the use of icons to represent symptoms that a user may select in order to enter characteristics. More specifically, as described relative to Fig. 11 (Specification p. 25, lines 4-15 for example), the user interface screen 330 enables a user's selection of the "Distribution" item on menu bar 288. As a result of such a selection, pictorial menu 360 is displayed over the image window 334 in region 298. The pull-down pictorial menu 360 depicts various selections for the distribution of possible dermatologic rash patterns. In the menu, the individual selection regions 362 include a graphical representation of the distribution 364, along with a brief written description in region 368. Through the use of pictorial representations or icons the system allows a user to select a visual characteristic of the patient (e.g., where the symptoms of the disease are distributed on the body). Assuming that a user were to select item 370 (scattered haphazard), the user-interface screen of Figure 12 would be displayed, particularly in window 292 as a characteristic.

Dependent Claim 17: Dependent from claim 16, claim 17 further characterizes the nature of the icon referred to in claim 16. Support for the use of an icon to depict the form of a lesion is found, for example, in Fig. 7, and is further described at page 23, line 18 through page 24, line 2.

Dependent Claim 18: Also dependent from claim 16, claim 18 further characterizes the nature of the icon referred to in claim 16. Support for the use of an icon to depict distribution of the dermatological lesions about a patient's body is found, for example, in Fig. 11 as noted previously, and is further described at page 25, lines 4-15.

Dependent Claims 19 - 21: Support for the use of the system of claim 5 in regard to the identification or diagnoses of oral medications is found relative to the various

alternative embodiments, both in both Fig. 16 and at pages 36-40. The characteristics described relative to the oral medication embodiment include those set forth at p. 38, lines 11-18, and include shape and color as depicted in the figure and described at page 39, line 29 through page 40, line 9.

Dependent Claim 22: Claim 22, dependent from claim 5, further defines the nature of the characteristics that the system may operate on, and particularly recites "characteristics determined during an autopsy." Support for such a limitation is found, for example, in the discussion of an alternative embodiment as found at page 40, line 26 through page 41, line 27.

Dependent Claim 23: Similarly, claim 23 is directed to a further alternative embodiment of the system of claim 5, and particularly includes the limitation of "characteristics of a crime scene." Discussion of such an embodiment, and particular examples of the characteristics that may be employed are found at page 43, lines 2-7.

Dependent Claim 24: Claim 24 is also dependent from claim 5, and returns to the recitation of the group of characteristics set forth. Support for the various members of the group can be found not only in the figures but also, for example, at the following locations in the Specification: page 18, lines 4-12; page 19, line 30 through page 20, line 1; and page 26, lines 5-23.

Independent Claim 28: Support for independent claim 28, a system for cross-referenced access to image and knowledge databases for the purpose of assisting in the investigation of a death, are found in the alternative embodiment described at page 40, line 26 through page 41, line 27.

6. GROUND'S OF REJECTION TO BE REVIEWED ON APPEAL:

Claims 1 - 15, 19, 22 - 24 and 28 stand rejected under 35 USC §103(a) as being unpatentable over US 5,437,278 to Wilk (Wilk) in view of US 4,945,476 to Bodick et al. (Bodick).

Claims 16 - 18 and 20 - 21 stand rejected under 35 USC §103(a) as being unpatentable over Wilk in view of Bodick and further in view of US Application 2003/0036683A1 to Kehr et al. (Kehr).

7. ARGUMENT:

Several questions are presented in this appeal:

First, whether claims 1 - 15, 19, 22 - 24 and 28 were properly rejected under 35 USC §103(a) as being unpatentable over Wilk in view of Bodick, including

(a) whether the rejection under 35 USC §103(a) improperly combines two patents that teach away from one another, and

(b) whether the rejection under 35 USC §103(a) omits elements recited in the rejected claims; and

Second, whether claims 16 - 18 and 20 - 21 were properly rejected under 35 USC §103(a) as being unpatentable over Wilk in view of Bodick and further in view of Kehr, including not only the questions posed above, but also

whether the rejection improperly relies upon a "reference" not made of record and available only after Appellants' priority date.

Rejection Under 35 U.S.C. §103

Appellants respectfully submit that this invention is unique and has extensive application and utility. Under section 35 U. S. C. §103, the Patent and Trademark Office must make out a case of *prima facie* obviousness and it is incumbent upon Appellant to rebut that case with objective evidence of non-obviousness, *In re Tiffin and Erdman*, 170 USPQ 88 (CCPA, 1971). In determining the propriety of the Patent and Trademark Office's case of *prima facie* obviousness, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him (her) to make the proposed substitution, combination or other modification. The conclusion of *prima facie* obviousness may be rebutted and the claimed subject matter ultimately held to be legally non-obvious if there are differences between the patent application and the prior art's motivation for adding an element, or if the claimed subject matter has unexpectedly superior properties or advantages as compared to the prior art, *In re Lintner*, 173 USPQ 560, (CCPA, 1972).

It is well known that a determination of obviousness rests upon the answers to the factual inquiries set forth in *Graham v. John Deere Co.*, 383 US 1 (US Sup. Ct. 1966); scope and content of the prior art; differences between the prior art and the claims at issue; and level of ordinary skill in the art. In *Panduit Corp. v. Dennison Mfg. Co.*, 1 USPQ2d 1593 (Fed. Cir. 1987), the court stated that "[w]ith the involved facts determined, the decision maker confronts a ghost, i.e. "a person having ordinary skill in the art", not unlike the "reasonable man" and other ghosts in the law. To reach a proper conclusion under section 103, the decision maker must step backward in time and into the shoes worn by that "person" when the invention was unknown and just before it was made. In light of *all* the evidence, the decision maker must then determine whether the patent challenger has convincingly established, 35 U.S.C. 282, that the claimed invention as a whole would have been obvious at that time to that person. 35 U.S.C. §103. The answer to that question partakes more of the nature of law than of fact, for it is an ultimate conclusion based on a foundation formed of all the probative facts. If itself a fact, it would be part of its own foundation. . . . a prior patent must be considered in its entirety, i.e., as a *whole*, including portions that would lead away from the invention in suit." The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990; *emphasis added*). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *Id.* at 1432.

Finally, the Examiner may not use the Appellant's disclosure as a recipe for selecting portions of the "prior art" to construct Appellant's claimed invention. A piecemeal reconstruction of the prior art patents in light of Appellant's disclosure is not a basis for a holding of obviousness, *In re Kamm et al.*, 172 USPQ 298 (CCPA, 1972). The mere fact that the prior art could have been modified does not make the modification obvious unless the prior art suggested the desirability of such a modification, *In re Gordon*, 221 USPQ 1125, (Fed. Cir. 1984); *Jones v. Hardy*, 220 USPQ 1021, (Fed. Cir. 1984). Moreover, this teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on the Appellant's disclosure. *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991).

Were claims 1 - 15, 19, 22 - 24 and 28 properly rejected under 35 USC §103(a) over Wilk in view of Bodick, (1st Question)

The disclosures of Wilk and Bodick are both directed to automated medical diagnosis. Appellants respectfully contend that the inherent ambiguity of medical diagnosis requires, not automated diagnosis, but a knowledge presentation facilitating rapid comparison and perception by the user - an essential distinction set forth in the rejected claims of the present application. The ability of the human eye to make visual comparisons between thousands of possibilities is impossible, yet when choices are constrained to a few, recognition is near instantaneous. The purposeful design of the claimed system and method in the instant application combines medically relevant knowledge to filter or "presort" the search results to a manageable number of diagnostic possibilities. This combination of a medical knowledge base interwoven with visual representations of possible diagnoses, which provide the ability to visually match what the system user sees displayed relative to possible diagnoses and on a patient, is not believed to be described in Wilk, Bodick or any other reference. Appellants further note that the display of a plurality of images, for example in the claimed diagnostic stack, is believed to be a patentably distinguishable aspect of Appellants' invention. While there may be decision support systems used in human medicine, none support presentation of visual knowledge using a plurality of images, moreover none allow for the display of visual complexity, contextualized to the user search as recited in the limitations of the current claims.

With respect to the first question, Appellants submit that two sub-questions must be considered in order to arrive at a determination as to whether claims 1 - 15, 19, 22 - 24 and 28 were properly rejected.

(a) Improper combination of patents that teach away from one another

Appellants respectfully submit that the rejection under 35 USC §103(a) must fail because Wilk and Bodick are not properly combined so as to establish *prima facie* obviousness. More specifically, the two patents teach away from one another and fail to support the combination/modification urged as the basis for the rejection.

Wilk is clearly directed to a medical diagnostic system described as having a device 20 for monitoring and measuring a biological or physiological parameter, transmitting the parameters to a computer 24, and ultimately communicating a medical diagnosis as determined by the computer. As set forth at col. 3, lines 58 - 63, "because

diagnoses are made by computer in accordance with the present invention, it is frequently unnecessary to have a doctor present during data taking (symptom recording and measurement) and communication of the diagnosis to the patient.” (emphasis added) At col. 5, lines 30-31, Wilk suggests a video camera for obtaining an image of a portion of a patient’s skin. And, as noted by the Examiner, Wilk suggests use of the system for dermatological diagnosis wherein images of skin conditions are stored (col. 2, lines 46-56 and col. 6, lines 17-21).

While Wilk is clearly directed to an automated medical diagnostic system, where the “diagnoses are made by computer” (col. 3, line 58), the claimed invention, conversely, recognizes the inherent problems with computer diagnostic systems, and is intended, as recited in the preamble, to aid in the diagnostic process – not as a substitute for a medical professional’s diagnosis, but to visually assist such a professional with a diagnosis. Appellants further contend that Wilk’s automated diagnostic system teaches away from an aid in a visual diagnostic process as recited by the rejected claims. If that were not the case, why would Wilk indicate that the diagnosis is made by the computer? In the Final Office Action, the Examiner urged that Wilk’s suggestion that the diagnosis may be confirmed “[supports] the idea that the invention may be used as an aid rather than a final diagnosis.” Appellants urge that Wilk’s use of the term “confirm” clearly establishes that a diagnosis was and has been made, and the indication that it is “confirmed” by a physician further supports the intent of Wilk to provide an automated medical diagnostic system.

Appellants again submit that the operation of the Wilk system, to identify a diagnosis, is contrary to the teachings and claims of the application on appeal. In particular, Appellants have noted above and in previous responses that the advantages of the present invention arise from access to information relating to a plurality of diagnoses, whereby the medical professional is provided information to compare with the patient (or sample) and make the diagnosis. In other words Wilk, at best, would provide a diagnosis but could not provide the medical professional with information on a plurality of diagnoses, as set forth in the rejected claims, to enable the professional to make the diagnosis.

While Wilk does disclose the storage of images, it does not disclose the storage of images in an image database, nor the cross-referencing of the image database with the knowledgebase for purposes of assisting in the diagnostic process as recited in

the rejected independent claims (e.g., claims 1, 3, 5 and 28). Appellants' review of Wilk did not identify reference to a database, or separate image and knowledge databases. Rather, what was found was reference to bulk storage and memory (e.g., 28 in Fig. 1), which do not teach the image database and knowledgebase recited in the rejected claims.

Similarly, Appellants review of Wilk, particularly at columns 4 and 7, fails to identify a user interface to "solicit ... a plurality of descriptive characteristics of a sample requiring diagnoses" and use of such characteristics to automatically identify a subset of diagnoses as recited in amended claim 1. Although Wilk does describe a keyboard, used for entry of information identifying the patient (col. 4, lines 50-51), Appellants submit it to be improper to ascribe to such teaching support for the claimed limitations of "solicit[ing], from a user, a plurality of descriptive characteristics of a sample requiring diagnoses," as recited in claim 1. To view such a teaching in the manner urged in the rejection would be to suggest that a diagnosis may be determined by simply inputting information to identify a patient. Wilk clearly teaches that it is devices 20 (thermometer, blood pressure gauge, etc. as described at col. 4, lines 32-39) that provide the information upon which a diagnosis is determined – which would not be understood to be user input.

Appellants further maintain that there is no teaching in Wilk of the use of monitor 74 for other than communicating diagnostic results (col. 6, lines 52-53). This distinction is further emphasized by the systems and methods recited in the independent claims – which do not require the uploading or transmission of image data for computer analysis, but rely on the user's visual comparison of previously stored images (image database), organized in response to characteristics, in conjunction with a subset of possible diagnoses, to that which is observed by the user.

Wilk is also acknowledged as failing to disclose identifying a subset of diagnoses and using the subset of diagnoses to reorganize an information space of said image database for concurrent presentation of a plurality of images for user review via the user-Interface.

Next, the rejection urges that Bodick teaches the limitations of the independent claims not taught by Wilk. Bodick discloses the creation of a knowledge base containing both pictorial images and textual information therein (col. 2, lines 39-40), along with a system to use such information in a medical diagnosis. The system is

further described as being dynamic; to permit the addition of newly discovered characteristics observed in patients and deletion of characteristics having little diagnostic importance. As Bodick points out, the disclosed knowledge base is distinct from a classic database (col. 3, lines 12-16).

Although Bodick does describe alternative methods of accessing the knowledge base (by cases having specific features or by cases in which a particular disease was diagnosed; col. 5, lines 42-48), Appellants respectfully submit that such a teaching does not give rise to the recited limitations of “automatically identify[ing], from a plurality of possible diagnoses, a subset including a plurality of diagnoses that are consistent with the characteristics.” It is further urged by Appellants that Bodick and Wilk both presuppose that there is always a diagnostic answer, when in fact there is often no definitive answer in human medicine.

With regard to the claimed limitation of “automatically reorganizing an information space of said image database for concurrent presentation of a plurality of images for user review,” Appellants respectfully submit that no such teaching is found in Bodick, and that Bodick, in fact, teaches away from such a limitation. For example, at col. 2, lines 59-61, where a comparison is described between “one patient or sample” and a “previous patient or sample” there is nothing to suggest that more than a single representation is displayed at one time – resulting in a user having to remember a prior image(s). Similarly, col. 6, lines 19-22 of Bodick clearly indicate that information from a single record is displayed – not the concurrent display of a plurality of images reflecting a subset of diagnoses, as recited in the rejected claims (e.g., claim 1). Appellants respectfully urge that when considered in the context of any significant database, the system of Bodick et al. results, in all likelihood, in a user having to separately review numerous images sequentially, yet not have them available for concurrent, side-by-side comparison representing multiple diseases or diagnoses.

Having described the general teachings of Wilk and Bodick, Appellants respectfully urge that the two patents are not properly combined. As the basis for the rejection, the Final Office Action alleged that “it would have been obvious to one of ordinary skill in the art at the time of Appellant’s invention to modify the system of Wilk and incorporate the ability to identify a subset of possible diagnoses based on a sample of characteristics and further to display the images or other data related to the subset of diagnoses as taught by Bodick et al.” Appellants respectfully urge that Wilk

teaches away from such a modification. What motivation would there be to display Bodick's images to a patient that has been diagnosed by the Wilk system, particularly when Wilk indicates that the computer conducts an image comparison (col. 2, lines 46-56)?

Appellants previously challenged this basis for combination/modification, and in response the Office indicated that Wilk is interpreted as disclosing an aid to diagnosis. As noted above, and previously (e.g., Response After Final), this is a mischaracterization of Wilk, which is directed to a "medical diagnostic system" (col. 4, line 29), where the relationship to a physician is stated as "eventually sees a physician for confirming the diagnosis" (col. 3, lines 64-65), and not as an aid. Automated diagnostic systems, such as disclosed by Wilk, are not designed to assist a user in diagnosis let alone the critical need to tolerate the ambiguity and complexity of medical diagnoses. Appellant respectfully stresses this distinction and the purposeful design of the claimed invention to aid recognition within the context of the inherent variation of human nature.

In response to Appellants' arguments against the combination, the Final Office Action indicated that the motivation for the combination was then to be found in Wilk, and reference was made to col. 4, lines 64-68. Appellants urge, however, that when taken in context, Wilk would not suggest the use or display of a image as described by Bodick (at best the cited language indicates a reduction in the time for examination, not necessarily diagnosis) – one of ordinary skill in the art would not be so motivated as the "diagnoses are made by computer in accordance with the present invention." (col. 4, lines 58-59). It also remains unclear what would have motivated one skilled in the art to modify Wilk's automated medical diagnostic system to make it "unautomated" and used for searching of case data. No motivation is found in Bodick to suggest making Wilk's automated diagnostic system a manual system. Rather, Appellants respectfully urge that it the claims of the instant application that have been used as the "recipe" from which elements of the cited patents have been selected. (see *In re Kamm et al.*, *In re Gordon*, *Jones v. Hardy*, and *In re Vaeck* as referenced above). Accordingly, Appellants respectfully urge that the modification of Wilk in view of Bodick is not supported by the references, the rejection is traversed, and claims 1, 3, 5 and 28 are respectfully urged to be in condition for allowance.

(b) Omission, in the rejection, of elements recited in the rejected claims

Even considering, *in arguendo*, a combination of Wilk in view of Bodick, at most the combination teaches the use of a common collection of data or knowledge for an automated medical diagnostic system. The modifications suggested by Bodick (with arguments to the contrary presented previously) would at most suggest that data of the Wilk system may be searched and text and/or an image from a case displayed to a user of the system as suggested by Bodick. Such a combination or modification does not, however, give rise to a user interface to solicit a plurality of descriptive characteristics of a sample requiring diagnosis as recited in claim 1. And, as noted above, neither Wilk nor Bodick teach the automated identification of a subset having a plurality of diagnoses, in response to characteristics. To assure proper consideration of these limitations, Appellants direct the Board's attention to pages 25 – 28 of the Specification, and Figures 12 and 14, which describe and illustrate the response of the present invention to additional characteristics (findings) and the reordering of the information space (note the change in ordering of images/diagnoses in response to the addition of the "obesity" characteristic in window 292).

Conversely, the arguable combination teaches, at most, the manual searching of case records, and as suggested by Bodick, the display of an image or text associated with the case record. Appellants respectfully submit that neither reference teaches the automatic reordering of an information space and concurrent presentation of a plurality of images for user review, as recited in independent claims 1, 3, 5 and 28. The claims are, therefore, patentably distinguishable over the arguable combination.

The Final Office Action urges, that Bodick's teaching of side-by-side presentation of image and text information "seems to suggest that a concurrent display of a plurality of images." (Final Office Action p. 3, Item 6) Appellants respectfully maintain that Bodick does not teach, in the numerous displays shown in the figures, a display depicting a plurality of images. Moreover, Bodick teaches, relative to Figs. 13A, 14 and 14A, "[t]he flow chart of FIG. 14A, which is reached from the flow chart of FIG. 13A, depicts how this viewing of an image is carried out, and FIG. 14 illustrates a display screen of what is viewed by the expert." (col. 23, lines 65-68; emphasis added). Thus, in spite of the Examiner's urging to the contrary, Bodick teaches a single image display and fails to teach or suggest the concurrent presentation of a plurality of images for user review as recited in the rejected claims.

With regard to claims 2 and 4, Appellants hereby incorporate the arguments set forth above relative to the independent claims, and continue to urge that the Examiner has mischaracterized the search capability of Bodick. Claims 2 and 4 recite automatically reorganizing the information space in response to a user's modification of a descriptive characteristic. The recited feature is depicted, for example, in Figures 7 and 8 and described at page 24 of the as-filed application – where a user's selection of a descriptive characteristic results in the alteration of the images displayed. No such teaching has been identified or illustrated in Bodick. With due respect to the Examiner, the Bodick disclosure of permitting an expert to compare observations (col. 2, line 55), designate diagnostic features (col. 5, line 54) or the ability to modify a category name (col. 20, lines 4 – 6), does not teach or suggest automatically reorganizing the information space upon modification of at least one of the plurality of descriptive characteristics by the user. Accordingly, Appellants respectfully traverse the rejection and urge that claims 2 and 4 are, independently, patentably distinguishable over the arguable combination of Wilk in view of Bodick.

With regard to claim 5, Appellants respectfully maintain that Wilk discloses an automated medical diagnostic system, whereas claim 5 recognizes the inherent problems with such systems and is intended, as recited in the preamble, to reduce diagnostic uncertainty – not as a substitute for a medical professional's diagnosis. While Wilk does disclose the storage of images, it does not disclose the recited user interface, the storage of images in an image database, let alone the acknowledged failure to disclose or suggest the automatic reorganization of an information space and concurrent presentation of images for user review.

Both Wilk and Bodick fail to address diagnoses when there are hundreds or even thousands of variations and images that are at the core of medical diagnosis and the biologic world. Like Wilk, Bodick also fails to teach or suggest the automatic identification of a subset including a plurality of diagnoses, and then using the subset, automatically reorganizing the information space to provide for its presentation to the user – using concurrent presentation of multiple images for review. Absent a teaching relative to the recited identification of a plurality of diagnoses, and the automated reorganization of the information space in an image database for concurrent presentation of images (specifically recited in claim 5), *prima facie* obviousness has not been established. Accordingly claim 5, and all claims

dependent therefrom, are respectfully urged to be patentably distinguishable over the arguable combination of Wilk in view of Bodick.

Independently considering the rejection of claims 6 – 11, the Examiner acknowledges that Wilk fails to teach an image stack, yet maintains that Bodick discloses a diagnostic image stack, as recited in the rejected claims, by disclosure of a diagnostic tree in Fig. 26. The Board is referred again to Figures 8 and 12 - 15 of the instant application, and the associated description at pages 24 – 25 of the Specification. Appellants further refer to page 29 of the instant application, where lines 13 - 29 state,

“Users are able to view a results in the “contact sheet” format such as is depicted in Figures 8, 12 and 14, which include reduced-size image thumbnails in stacks, grouped by diagnosis. This interface represents one of the core functionalities of the present invention. As contrasted to a simple image database or image atlas, the diagnostic grouping of thumbnails allows the user to visually scan and review images in the context of diagnostic possibilities. Each diagnostic “stack” may also allow for a set of controls that permit the user to sort the images in the “stacks” by body location (this facilitates comparison of like lesions between diagnoses), “spread” out the stacked thumbnails so all thumbnails for a particular diagnosis can be viewed in a separate window (e.g., Figure 9), and display the related findings for the diagnosis. Thumbnails will also be easily exploded into full screen images at a mouse click such as depicted on screen 352 in Figure 15. It is also contemplated, in accordance with the image display, that the diagnostic image stack may be organized for display to depict a natural progression through stages of disease progression.”

Conversely, Appellants respectfully maintain that Bodick is clear as to the contents of Figure 26. At col. 9, line 22, Figure 26 is described as “a display used in selecting a diagnosis tree” and at col. 21, lines 18 – 29, as “an example of an existing diagnosis tree.” Appellants remain unable to determine where in Figure 26 the Examiner is able to find a “diagnostic image” let alone the recited “diagnostic image stack.” Figure 26 does disclose various nodes of a diagnostic tree for editing, and the “[d]iagnoses are listed in a hierarchy, and the selection by the user of any diagnosis

included in the displayed list results in a list of next lower level diagnoses, the selection of any one of which results in yet another list of a still lower level of diagnoses, and so on" (col. 17, lines 44 – 48). These sequential levels of diagnoses indicate the dependence of a given diagnosis on the preceding higher levels of diagnoses. Appellants respectfully maintain that the hierarchy depicted in Bodick does not teach a diagnostic image stack as the term has been employed to characterize a group of images in the context of diagnostic possibilities.

Furthermore, Bodick's design premise is the ordering and display of diagnoses within a hierarchical "tree". A hierarchical "tree" structure is an information strategy entirely distinct from the overlapping, Venn functionality offered by the recited image stack of the present application, and more particularly "wherein the index is independent of the common diagnosis." as recited in claim 7. The present invention allows the user to enter multiple characteristics which then result in diagnoses displayed by a number of matches. Dependent upon user morphologic images, diagnostic images sort to the top of diagnostic stacks. The ability of the user to visually scan and compare diagnoses along two axes simultaneously (concurrent display of images), diagnostic matches, and morphologic matches aid comparison and anticipate the need to assist perception and recognition within the context of ambiguity. The hierarchical display of diagnoses nodes in Bodick (Fig. 26 does not even include images) simply does not allow, and teaches away from, the flexible display of diagnoses in image stacks as recited in the present claims. Thus, Bodick does not teach the display of a diagnostic image stack as the term is used herein.

Independently considering claim 8, as noted by the Examiner (Final Office Action, p. 9, middle), Bodick also fails to disclose the alteration of the image stack in accordance with disease progression set forth in claim 8. In spite of the noted failure to disclose the limitations of claim 8, the Examiner urges that "this would have been obvious in view of the teachings of Bodick et al in an effort to offer a plurality of images to the physician in order to determine the nature of the particular disease associated with the current patient." Notably, the rejection fails to indicate to whom this would have been obvious to, and what teaching or suggestion is relied upon to support such a conclusion. Absent such a basis, Appellants respectfully maintain that *prima facie* obviousness has not been established relative to claim 8.

In addition to the above-noted distinctions, Appellants reiterate that claims 6 – 11 depend from presumably allowable claim 5. Accordingly, Appellants respectfully traverse the rejection and submit that claims 6 – 11, for the reasons independently set forth above, are also patentably distinguishable over the arguable combination of Wilk in view of Bodick.

With regard to claim 12, in addition to being dependent from presumably allowable claim 5, claim 12 further requires using characteristics of diagnoses, solicited via the user interface, to perform pattern recognition and identify diagnoses with matching characteristics. On the other hand, Wilk teaches the comparison of digitized data from monitoring/measuring device 20 for purposes of deriving a diagnosis of the patient's condition. Thus, Wilk cannot teach what has been alleged, as to do so would require a user-interface for entry of characteristics observed by a user that are not taught or suggested by Wilk. As noted previously, the Wilk user interface is not described as facilitating the entry of diagnostic characteristics. Thus, Appellants urge that in addition to being dependent from allowable claim 5, claim 12 is independently patentably distinguishable over the arguable combination of Wilk in view of Bodick.

With regard to claims 13 - 14 and 15, Appellants once again urge that these claims are, independently, patentably distinguishable over the arguable combination for the reasons set forth above relative to claim 5. Moreover, while acknowledging that Wilk suggests use of the automated medical diagnostic system for dermatological diagnosis, there is no suggestion that such diseases must be of a type having visual findings visible to an unaided human eye or require mechanical examination (claims 14 and 15, respectively) – the latter being of some question as to how it may be performed by the automated system of Wilk. It appears, the diagnostic input employed by Wilk system is obtained from the described devices or possibly the video camera. Hence, claims 13 – 15 are respectfully urged to be patentably distinguishable over the arguable combination of Wilk in view of Bodick.

Considering claims 19 and 22-23, each of these claims includes limitations relative to alternative uses of the system of claim 5. The Examiner acknowledged that Wilk and Bodick both fail to teach the alternative applications (oral medications, autopsy, crime scene) set forth in claims 19 and 22-23. Nonetheless, the rejection urges that Bodick's suggestion of the use of image data is somehow a teaching of such limitations. The rejection fails to set forth what teaching in Wilk or Bodick is relied

upon as suggesting a use for the identification of oral medication, or where the characteristics are determined during an autopsy or crime scene investigation as set forth in claims 19, 22 and 23, respectively. Instead, the conclusory statement that “it would have been obvious to one having ordinary skill in the art at the time of Appellant’s invention to modify the system of Wilk and utilize the invention for any purpose as suggested by Bodick et al for the cognitive process of diagnosis” is made without any support. Redefining Bodick to broadly cover any “cognitive process of diagnoses” is not only unsupported by Bodick, but is entirely outside of what one of ordinary skill in the art would have been motivated to do. Absent a teaching or suggestion of the limitations set forth in the claims, obviousness cannot be established. Hence, Appellants independently traverse the rejections of claims 19, 22 and 23, and respectfully maintain that the Examiner has failed to establish *prima facie* obviousness.

Relative to claim 28, in setting forth the rejection, the Examiner failed to establish where each of the recited limitations is taught or suggested by the references relied upon – either alone or in combination. In particular, the Examiner acknowledged that none of the references of record is described as providing assistance in investigating a cause of death, nor are particular characteristics as to a manner of death, wound type, modality, etc. taught or suggested as characteristics either by Wilk or Bodick. Nonetheless, the rejection asserts that Bodick teaches the importance of using images and text “in any area where the appearance of an object under study/examination is of critical importance” as taught by Bodick at col. 9, lines 47-50. Appellants maintain that the suggestion of the use of images does not give rise to a basis for the rejection – nor does it teach the specific limitations set forth in a manner so as to have rendered it obvious to one of ordinary skill in the art at the time of the invention - particularly when the rejected claim recites specific limitations not found in the references. Appellants respectfully traverse the rejection of claim 28 and contend that *prima facie* obviousness has, once again, not been established, and that claim 28 is in condition for allowance.

Were claims 16 - 18 and 20 - 21 properly rejected under 35 USC §103(a) over Wilk in view of Bodick and further in view of Kehr (2nd Question)

With regard to the rejection of claims 16 - 18 and 20 - 21, Appellants previously questioned the Examiner’s “Official Notice” as to the use of icons. However, even if

use of icons was known at the time of the invention, their use in the manner recited in the rejected claims is respectfully urged to be both unknown and non-obvious. Moreover, the Official Notice was proposed in conjunction with Wilk and Bodick, yet the Examiner did not indicate where the motivation for making use of icons was taught or suggested by either Wilk or Bodick.

Accordingly, Appellants' position remains that Wilk needs no such icons as it is not a diagnostic aid, but an automated medical diagnostic system. Similarly, Bodick failed to suggest use of icons, and does not appear to teach or suggest the particular manner in which rejected claims 16 - 18 and 20 - 21 use such icons (e.g., symptoms represented as icons; icon indicates distribution of lesions on body; shape of medication, color). Absent some teaching or suggestion of the recited limitations, Appellants maintain the Official Notice was an attempt at a hindsight reconstruction of claim elements using the claims as the "recipe," and further filling in missing elements (not merely interpretations) through the improper use of Official Notice. Appellants also requested that in the event the rejection was maintained the Examiner set forth document(s) teaching all of the recited limitations, and indicate the motivation for such a combination.

Rejection improperly relies upon a "reference" not made of record and available after Appellants' priority date

In response to Appellants noting the failure of the rejection to set forth a disclosure of all of the recited elements so as to establish *prima facie* obviousness, the Examiner rejected the claims, for the first time in the Final Office Action, relying upon a combination that included an additional reference to Kehr. Appellants maintain that the Kehr publication is not even available as a reference against the instant application as it has a filing date (May 7, 2001) that is well after the earliest provisional application from which the instant application claims priority (e.g., Provisional Application No. 60/222,573, filed August 1, 2000, which discloses the use of icons). In the event the rejection relies upon one of the earlier applications referenced by Kehr, Appellants previously noted that no such document has been properly made of record or cited in the rejection. Thus, the rejection presently relies upon a US patent publication for an application that was filed well after the earliest priority date claimed in the instant application the Kehr publication simply cannot be available as a reference.

Appellants further note that this failure to establish *prima facie* obviousness was noted in responses to both the Final Office Action and the Pre-Appeal Brief Conference Request. Notably, Kehr was urged (Advisory Action p. 2) as “only to support the official notice previously presented,” which suggests that it need not meet the requirements of a reference. Appellants respectfully maintain, as set forth at the beginning of this section (see *In Re Lintner*), that it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art to make the proposed substitution, combination or other modification. Furthermore, MPEP 2144.03 indicates that as noted by the court in *Ahlert*, any facts Officially Noticed should be of notorious character and serve only to “fill in the gaps” in an insubstantial manner which might exist in the evidentiary showing made by the examiner to support a particular ground for rejection. It is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based. See *Zurko*, 258 F.3d at 1386, 59 USPQ2d at 1697; *Ahlert*, 424 F.2d at 1092, 165 USPQ 421. The present rejection acknowledged that Wilk and Bodick failed to teach the use of icons, but urged that the use of icons in a user-interface was well known. Appellants challenged the Examiner’s use of “Official Notice” as the basis for supporting an element clearly missing from the claims, and in reply the rejection was modified to include the Kehr publication. Appellants continue to urge that the Kehr publication is improperly relied upon in the rejection due to its filing date being well after the earliest priority date claimed in the present application.

Appellants further urge that even if considered, *in arguendo*, the additional of Kehr or other “Official Notice” does not give rise to the use of icons in the various manners expressly set forth in the rejected claims. Accordingly, Appellants respectfully traverse the rejection, request that the rejection be withdrawn, and that claims 16-18 and 20-21 be indicated as allowable.

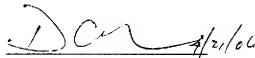
Conclusion

As set forth above, claims 1 - 15, 19, 22 - 24 and 28 were improperly rejected under 35 USC §103(a) as being unpatentable over Wilk in view of Bodick. In particular, the rejection under 35 USC §103(a) improperly combined Wilk and Bodick when they teach away from one another. In the alternative, when considered, *in arguendo*, the

rejection under 35 USC §103(a) combining Wilk and Bodick omitted elements recited in the rejected claims. Second, claims 16 - 18 and 20 - 21 were also improperly rejected under 35 USC §103(a) as being unpatentable over Wilk in view of Bodick and further in view of Kehr, particularly when the rejection improperly relies upon a "reference" available only after Appellants' earliest claimed priority date.

In light of the various arguments set forth above, Appellants respectfully submit that all of the questions presented should be answered in the negative, that all rejections set forth should be reversed, and that Appellants' pending claims should be indicated as allowable.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'D. C. Basch', is written over a horizontal line. To the right of the signature, the date '4/21/06' is handwritten.

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8. CLAIMS APPENDIX:

The following are the appealed claims:

1. (Previously Presented) A system to aid in a visual diagnostic process, comprising:

an image database;

a knowledge database, cross-referenced to said image database, for the purpose of assisting in the diagnostic process;

a user-interface to solicit, from a user, a plurality of descriptive characteristics of a sample requiring diagnoses;

a diagnostic engine, responsive to said characteristics, wherein said characteristics of the sample are employed by said engine to automatically identify, from a plurality of possible diagnoses, a subset including a plurality of diagnoses that are consistent with the characteristics; and

using the subset of diagnoses, automatically reorganizing an information space of said image database for concurrent presentation of a plurality of images for user review via the user-interface.

2. (Previously Presented) The system of claim 1, wherein said diagnostic engine operates dynamically, using the subset of diagnoses, to reorganize the information space upon modification of at least one of the plurality of descriptive characteristics by the user.

3. (Previously Presented) A method for aiding a visual diagnostic process, including the steps of:

creating an image database from a collection of images pertaining to a particular subject matter;

creating a knowledge database with other data related to the particular subject matter, wherein said knowledge database is cross-referenced to said image database, for the purpose of assisting in the diagnostic process;

collecting from a user, through a user-interface adapted to the particular subject matter, a plurality of descriptive characteristics of a sample requiring diagnoses;

in response to said descriptive characteristics, automatically identifying, from a plurality of possible diagnoses included within the knowledge database, a subset including a plurality of diagnoses consistent with the descriptive characteristics collected from the user; and

using the subset of diagnoses, automatically reorganizing an information space of said image database for concurrent presentation of a plurality of images related to the descriptive characteristics for user review via the user-interface.

4. (Original) The method of claim 3, wherein said diagnostic engine operates dynamically, using the subset of diagnoses, to reorganize the information space upon the user's modification of at least one of the plurality of descriptive characteristics.

5. (Previously Presented) A system for reducing diagnostic uncertainty using cross-referenced knowledge and image databases, comprising:

a user-interface to solicit a plurality of characteristics of diagnoses from a user;
a diagnostic engine, wherein said characteristics of diagnoses are employed to automatically identify, from a plurality of possible diagnoses for which data is stored in the knowledgebase, a subset including a plurality of diagnoses from the knowledgebase that are consistent with the characteristics; and

using the subset of diagnoses, automatically reorganizing an information space of the image database for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of a plurality of images for user review.

6. (Original) The system of claim 5, wherein the plurality of images are presented as a diagnostic image stack.

7. (Original) The system of claim 6, wherein the diagnostic image stack comprises:

a subset of said plurality of images, each image in said subset being associated with a common diagnosis; and

an index into said subset of images wherein the index is independent of the common diagnosis.

8. (Original) The system of claim 6, wherein the diagnostic image stack is displayed to depict stages of disease progression.

9. (Original) The system of claim 6, wherein the diagnostic image stack is displayed to depict a plurality of images associated with a particular diagnosis.

10. (Original) The system of claim 5, wherein at least one image presented to the user includes a display of associated characteristics of diagnoses when a user selects a portion of an image being displayed.

11. (Previously Presented) The system of claim 5, wherein the presentation to the user is accomplished through a display, and where the display concurrently indicates textual information retrieved from the knowledgebase that is related to at least one of the subset of diagnoses.

12. (Original) The system of claim 5, wherein the diagnostic engine uses the characteristics of diagnoses to perform a pattern recognition operation on the knowledge database and to identify diagnoses with matching characteristics.

13. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics of diseases that have a dermatological manifestation.

14. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics of diseases that are of a visual findings type visible to the unaided human eye.

15. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics of diseases that are determined based upon a finding determined by mechanical examination means.

16. (Original) The system of claim 5, wherein the user-interface to solicit a plurality of characteristics includes at least one symptom represented as an icon.

17. (Original) The system of claim 16, wherein the icon is an image depicting the form of a dermatological lesion.

18. (Original) The system of claim 16, wherein the icon is an image depicting a distribution of the dermatological lesions about a patient's body.

19. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics of oral medications.

20. (Original) The system of claim 9, wherein the iconic representation is an image depicting the shape of an oral medication.

21. (Original) The system of claim 19, wherein the iconic representation is an image depicting a color of an oral medication.

22. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics determined during an autopsy.

23. (Original) The system of claim 5, wherein the system for reducing diagnostic uncertainty is applicable to and includes characteristics of a crime scene.

24. (Previously Presented) The system of claim 5, wherein the plurality of characteristics of diagnoses are selected from the group consisting of:

Travel History;
Occupation;
Exposures;
Radiological Signs;
Medications;
Habits;
Cutaneous Signs;
Morphology;
Dysmorphology;
Cutaneous Morphology; and
Distribution.

25. (Withdrawn) A system for aiding in the identification of orally-administered drugs using cross-referenced knowledge and image databases, comprising:

- a user-interface to solicit a plurality of orally-administered drug characteristics;
- a diagnostic engine, wherein said characteristics are employed to identify, from a plurality of possible identifications, a subset of identifications that are consistent with the characteristics; and

- using the subset of identifications, reorganizing an information space of the image database for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of a plurality of images of orally-administered drugs for user review as image stacks.

26. (Withdrawn) The system of claim 25, wherein the pill characteristics include at least once characteristic selected from the group consisting of:

- color;
- markings;
- shape; and
- size.

27. (Withdrawn) A system for cross-referenced access to image and knowledge databases for the purpose of assisting in the identification of street drugs, comprising:

- a user-interface to solicit a plurality of characteristics of a sample from a user, including one of the group of characteristics consisting of form, method of administration, markings, color, geographic location of use, user symptoms, and chemical composition;

- a diagnostic engine, wherein said characteristics of the sample are employed to identify, from a plurality of possible street drugs, a subset of street drugs that are consistent with the characteristics; and

using the subset of street drugs, reorganizing an information space of the image database for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of a plurality of images for user review in the identification of the street drug.

28. (Previously Presented) A system for cross-referenced access to image and knowledge databases for the purpose of assisting in the investigation of a death, comprising:

a user-interface to solicit a plurality of characteristics of the death, including at least one of the group of characteristics consisting of manner of death, wound type, sub-wound type, modality, and medical lexicon;

a diagnostic engine, wherein said characteristics of the death are employed to identify, from a plurality of possible causes of death for which data is stored in the knowledgebase, a subset of causes from the knowledgebase that are consistent with the characteristics; and

using the subset of causes, reorganizing an information space of the image database for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of a plurality of images for user review in the identification of the cause of death.

29. (Withdrawn) A system for cross-referenced access to image and knowledge databases for the purpose of assisting in the identification of plants, comprising:

a user-interface to solicit a plurality of descriptive characteristics of a plant sample from a user;

a diagnostic engine, wherein said characteristics of the plant sample are employed to identify, from a plurality of possible plants, a subset of plants that are consistent with the characteristics; and

using the subset of plants, reorganizing an information space of the image database for presentation to the user, wherein the presentation is accomplished through the concurrent presentation of a plurality of images for user review in the identification of the plant.

30. (Withdrawn) The system of claim 29, wherein at least one of said descriptive characteristics is selected from the group consisting of:

- size;
- leaf shape;
- leaf size;
- vein pattern;
- coloration;
- stem type; and
- geographic location where found.

9. EVIDENCE APPENDIX:

NONE

10. RELATED PROCEEDINGS APPENDIX:

NONE